Physics 300 (PHY300) Waves and Optics

The physics of oscillations and waves, from mechanical waves to light waves to electron waves. Topics include resonance and normal modes of coupled oscillators, the wave equation and wave propagation, interference and diffraction, polarization, imaging and coherence. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisite: PHY 132/PHY 134 or PHY 142/ PHY 134 or PHY 126/PHY 127/PHY 134
Co-requisite: MAT 203 or MAT 205 or AMS 261 or MAT 307

4 credits

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Textbooks: Vibrations and Waves by Anthony French, Modern Optics by Grant R. Fowles
Lectures: MW 11:45am-1:05 pm, F 11:45am-1:35pm
Grading: HW 20%, Midterm Exam 20%, Worksheets & Lab work 30%, Final Exam 30%

Worksheets are due the Monday of each week in class, and must be initialed by the TAs each day. Homework and Lab Reports are due on Friday in class. HW solutions will be posted on the course website on the date the HW is due. No late HW or Worksheets will be accepted.

Week of	Topic	Reading	Worksheet	Homework/Lab Reports
Jan 22	Simple Harmonic Oscillator	French Ch 1, 2	------	-------
Jan 29	Damping, Driving, Energy	French Ch 3,4	Worksheet #1	French 1-1,1-2,1-5,1-6, 2-1,2-2,2-3,2-4
Feb 5	Coupled Oscillators	French Ch 5	Worksheet #2	French 3-1,3-2,3-3, 3-13, 3-18,4-3,4-5,4-10, 4-13
Feb 12	Normal Modes	French Ch 5	Worksheet #3	French 4-16, 5-2, 5-4, 5-9, 5-10
Feb 19	Strings & Travelling Waves	French Ch 6	Worksheet #4	Lab report #1 Coupled Oscillators
Feb 26	Fourier Series	French Ch 6,7	Worksheet #5	French 6-1,6-2,6-6, 6-11

March 4	Maxwell & Wave Equations	Fowles Ch 1	Worksheet #6	French 6-12,6-14,7-1, 7-2,7-3,7-4
March 18	Plane Waves	Fowles Ch 2	Worksheet #7	French 7-5,7-6,7-8, 7-9, 7-16
March 25	Polarization	Fowles Ch 2	Worksheet #8	Fowles 1.2,1.3,1.5,1.6
April 1	Reflection & Refraction	Fowles Ch2	Worksheet #9	Fowles 2.8,2.10,2.12,2.16
April 8	Diffraction	Fowles Ch 5	Worksheet #10	Lab report #2 Polarization
April 15	Interferometers	Fowles Ch 3,4	Worksheet #11	Fowles 5.4,5.9,5.12,5.14
April 22	Ray Optics I	Fowles Ch 10	Worksheet #12	Fowles 3.6,4.1 (see eqns 4.9 and 4.20),4.5,4.7,4.8,
April 29	Ray Optics II & Review	Fowles Ch 10	Worksheet #13	Fowles 10.5,10.6,10.7

SPECIAL NEEDS: If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room 128, (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students requiring emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information, go to the following website: http://www.ehs.sunysb.edu/fire/disabilities/asp